

Licensable Technologies

Superluminal RF Source

Applications:

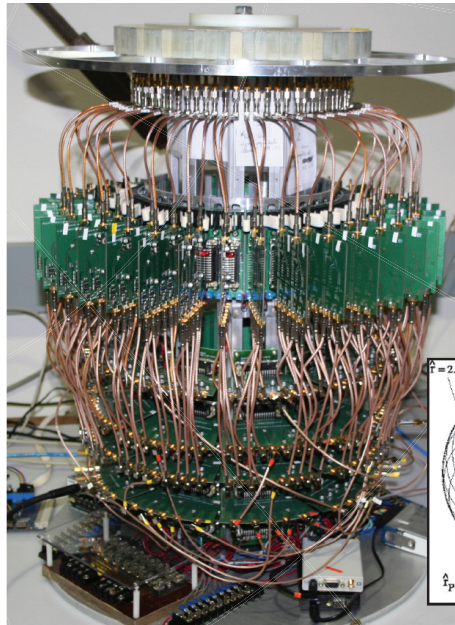
- RADAR
- Directed Energy
- Long-range communications
- Astrophysics
- Medicine (Oncology)

Benefits:

- RADAR imaging applications are countermeasure-resistant
- Communications can be spatially-encrypted
- 4-dimensional volumes of energy can be aimed at a single space-time point for directed energy applications
- Nonspherical decay of the cusp enables low-power communications and propagation over great distances

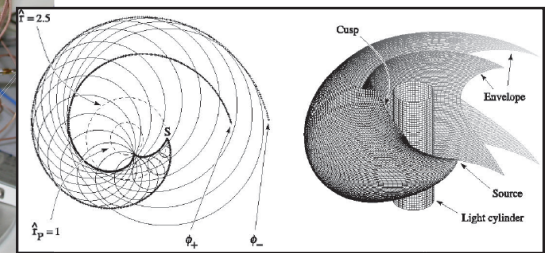
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Left: A fully Assembled 72-channel Antenna

Below: The cusp of a rotating superluminal source



Summary:

Los Alamos National Laboratory (LANL) researchers have developed an antenna that produces tightly-focused packets of electromagnetic radiation that are fundamentally different from the emissions of conventional transmitters. The device has potential applications in RADAR, directed-energy (non-kinetic kill,) secure communications, ultra-long-range communications (e.g. deep-space,) medicine (oncology,) and astrophysics.

The Superluminal RF Source is composed of an array of external electrodes. By inducing a polarization pattern in a dielectric and varying the oscillations on the different electrodes, the polarization current moves faster than the speed of light in a vacuum.

Though a radiation source exceeding the speed of light (c) may sound like a violation of Special Relativity, nothing prevents the distribution pattern of a polarization current, created by the coordinated motion of subluminal particles, from moving faster than c . Indeed, pulsar emissions have been demonstrated to result from modulated waves formed by superluminal distribution patterns of the polarization current rotating within the pulsar's plasma atmosphere.

A single superluminal source yields multiple contributions to the electromagnetic field of an observer located on the cusp. Because of this focusing effect, the cusp decays at $1/r$ rather than the conventional inverse square law, $1/r^2$. This nonspherically decaying phenomenon presents unique potential for applications in radar and directed-energy technologies, secure communications, medicine, and astrophysics.

Development Stage: Working prototype

Patent Status: Patent pending

Licensing Status: Available for exclusive or non-exclusive licensing